Paper No. 22

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HIROKI SAWADA,
TAKAYUKI KITANO, and
MANABU NAKAI

Appeal No. 2002-0183
Application No. 09/379,570

HEARD: December 10, 2002

Before KIMLIN, PAK, and LIEBERMAN, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-9. Claim 10, the other claim remaining in the present application, stands withdrawn from consideration.

A copy of illustrative claim 1 is appended to this decision.

The examiner relies upon the following references as evidence of obviousness:

Wade	5,503,690	Apr. 02, 1996
Bergsma	5,571,347	Nov. 05, 1996

Appellants' claimed invention is directed to an aluminum alloy comprising, inter alia, zirconium in the recited amount. According to appellants, contrary to conventional wisdom, they "have discovered that the size and shape of intermetallic particles do not control fracture in a 6000-series aluminum alloy", but that "of primary importance in controlling toughness in a 6000-series aluminum alloy is the **spacing** between intermetallic particles" (page 3 of principal brief, lines 1-5).

Appealed claims 1-9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Bergsma in view of Wade.

We have thoroughly reviewed the respective positions advanced by appellants and the examiner. In so doing, we concur with appellants that the examiner has not established a prima facie case of obviousness for the claimed composition. Accordingly, for simply those reasons expressed by the appellants, we will not sustain the examiner's rejections.

The examiner appreciates that Bergsma, the primary reference, discloses an element alloy that does not contain

zirconium as required by the appealed claims. The examiner reasons, however, that since Bergsma discloses that zirconium is typically used in aluminum alloys for grain refining, and Wade discloses the addition of zirconium to improve the combination of high strength and high toughness in aluminum alloys, it would have been obvious for one of ordinary skill in the art to add zirconium to the aluminum-magnesium-silicon alloy of Bergsma to improve fracture toughness. Also, although Bergsma does not disclose the claimed Charpy energy and volume percent per unit area for the alloy, the examiner concludes that the alloy resulting from the combination of Bergsma and Wade would necessarily exhibit the same properties.

The problem with the examiner's rationale, as properly articulated by appellants, is that one of ordinary skill in the art would not have had the requisite motivation to add zirconium to the aluminum alloy of Bergsma. Bergsma, while acknowledging that zirconium is a conventional component in aluminum alloys, assuages the use of zirconium in the inventive alloy and obtains a dendritic microstructure. Wade, on the other hand, discloses a zirconium-containing aluminum alloy having a highly elongated

uncrystallized, fibrous grain structure. Consequently, we must agree with appellants' reasoning that "[b]ecause Wade discloses that modification of Bergsma's alloy through the addition of 0.05-0.25 wt% Zr and homogenizing at 1000°F or less would convert Bergsma's dendritic microstructure into a fibrous structure, while Bergsma requires a dendritic microstructure, the skilled artisan would have no motivation to combine Wade with Bergsma" (page 6 of principal brief, third paragraph). Also, it must be borne in mind that it is necessary to modify the composition of Bergsma against its teachings in order to obtain an alloy that possibly may exhibit the presently claimed volume fraction.

We simply do not subscribe to the examiner's statement that "Wade et al. teaches that the addition of Zr to Al-Mg-Si alloys provides improved toughness and strength to Al-Mg-Si alloys in general, and Appellant's [sic] analysis of dendritic versus fibrous microstructures would appear to be irrelevant to this point" (page 4 of answer, second paragraph, last sentence). We find no disclosure in Wade to the effect that the addition of zirconium in general provides improved toughness and strength to such alloys and the examiner has pointed to no specific

disclosure. More significantly, however, is the examiner's erroneous conclusion that the different microstructures of the alloys of Bergsma and Wade are irrelevant to the obviousness of the claimed invention.

In conclusion, based on the foregoing, the examiner's decision rejecting the appealed claims is reversed.

REVERSED

EDWARD C. KIMLIN Administrative Patent Judge	)	
CHUNG K. PAK Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
PAUL LIEBERMAN Administrative Patent Judge	)	

vsh

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Appendix
Claim 1

1. An aluminum alloy forging comprising

Mg: 0.6 - 1.6% (mass% here and hereinafter),

Si: 0.6 - 1.8%,

Cu: 0.05 - 1.0%,

Fe: 0.30% or less,

one or more of Mn: 0.15 - 0.6% and Cr: 0.1 - 0.2%

Zr: 0.05 - 0.2%,

hydrogen: 0.25 cc/100 g A1 or less, and

a balance of A1 and inevitable impurities,

wherein the aluminum alloy forging is produced by a process comprising

casting an aluminum alloy at a cooling rate of 10°C/sec or higher to form a cast aluminum alloy ingot,

subjecting the cast aluminum alloy ingot to a soaking heat treatment at a temperature of 530-600°C, and

then hot forging the cast aluminum alloy ingot, and wherein a volume fraction of total constituents phase particles(Mg_2Si and Al-Fe-Si-Mn, Cr, Zr) series intermetallic compounds) in the aluminum alloy forging is 1.5% or less per unit area.